A STUDY OF VARIOUS FACTORS AFFECTING CONTRACTOR'S PERFORMANCE IN LOWEST BID AWARD CONSTRUCTION PROJECTS

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ABSTRACT

   Real estate sector in present scenario is going through a lean patch, many organisations are either running in loss or with a marginal profits. As in state government and central government departments contractors are facing huge problems that are in turn tending to decrease in contractor profits. The present study focuses on study of various factors that affect contractor's performance who have been awarded projects on the basis of lowest bid awards. The study analyses various factors and their impacts on the basis of responses collected form a survey. On the basis of overall index and relative importance index factor causing a major impact on contractor's efficiency have been identified.

Key words: contract management; contractor performance; subletting; lowest bid awards; contractor efficiency

1. INTRODUCTION

Lowest bidder approach is a common method applied for contractor selection of construction projects in India. As per studies available efficiency of contract in lowest bidder award projects is comparatively low. Major reasons being inflation, extension of duration, price escalation (S Deep et al). The major flow of lowest bid award method is work awards could be made on the basis of submission of deliberate and unrealistic bid by a contractor. This practice has led to a series of disputes and caused several stereotypes in work progress resulting in increased prices. One of vital tasks faced by a client willing for a success project outcome is to select an efficient c contractor (Plebankiewicz, 2010). Globally prequalification criteria are altered to select competent contractors. Once prequalification is completed, the client can then give work award to the contractor to start project. The literature available identifies several prequalification criterion that can be applied in the selection process; the most common of which are: management capability, technical ability, financial capacity, and occupational health and safety (Hatush and Skitmore, 1997; Plebankiewicz, 2009; Huang et al. 2014). Different evaluations are conducted for each criterion; however, the evaluations methods used for some processes are ambiguous or highly subjective (Hosny et al. 2013).But as current practice in Indian scenario lowest bidder award are highly practiced, though, prequalification is done using aforesaid criterions, yet work award is made to lowest bidder. To encounter this issue, many countries have adopted average-bid method and award t contract to a contractor whose price is closest to the average-bid and evaluates its merits in a similar way to the low-bid method (Ioannou et al, 1993). The prime advantage this method is that it protects owner's interest in case of unrealistic bid submissions (Ioannou et al, 1993).It has also been observed that this method also aids in removal of discrepancies in submitted bids.The disadvantage of the average-bid method is, it does not essentially promotes price competition, which is at times not beneficial for client. Many studies conducted concluded that average bidding method results in significantly higher profits for the contractors in projects (Irtishad, 1993).It has been observed that contractor has to face a series of constraints while execution of projects awards on the basis of lowest bid award methods. Presently in case of public sector projects in case of state government an overhead 10% of overall project cost exists in which contractor appoints a of the design team, the existing agreement between the client and the design team ceases and a new contractual agreement is implemented between the design team and the contractor for project completion (Doloi, 2008).Construction sector of many countries have recently undergone transformation, and projects are now subcontracted more frequently than in the past. Subcontractors are specialists in the execution of a specific job, and may supply personnel, materials, equipment, tools, and designs (Shimizu and Cardoso 2002). It can further remarked that a contractor has to face a series of constraints in case of lowest bid awarded projects. Some of them have been tried to be identified in this paper.

2. RESEARCH HYPOTHESIS

The study is aimed to identify the various causes that lead to decrease in efficiency of contractors in construction projects. It has been observed that the increase in overall duration in a construction is a persistent issue in case of lowest bid (S. Deep et al, 2016). An increase in duration of a construction projects has a widespread impact on overall cost of construction project. In current scenario retail inflation rate in case of construction materials is very high, similarly other factor like quality of equipment used, supervision from consultant side are some of common issues to be evaluated as part of this study.

3. RESEARCH METHODOLOGY

Two types of questionnaires were developed for diverse groups i.e. construction organizations and public organizations. Contractors, Sub contractors, Consultants, Architects and Engineers were included in the first group. The second group was comprised of public agencies and state/central

government departments. The responses obtained from questionnaire survey were analyzed to identify the trends and practices in bid and procurement in UP state government and central government owned construction projects. Questionnaires were also used to analyze the major difficulties faced by contractors that tend to decrease the efficiencies of contractors.

4. QUESTIONNAIRES RESPONSE RATE

A total of 275 questionnaires, 149 to construction organizations (contractors and consultants) and 126 to public organizations were distributed. Table 1 shows the summary of number of rate of responses by major stockholders.

Table 1 Summary of number and response rate by participants.

S.No.	Professional cadre of Respondents	No. of respondents	Percentage of responses
1	Consultants	24	8.73
2	Public Sector Organisation	126	45.82
3	Contractors	125	45.5
	Total	275	100

No. of respondents
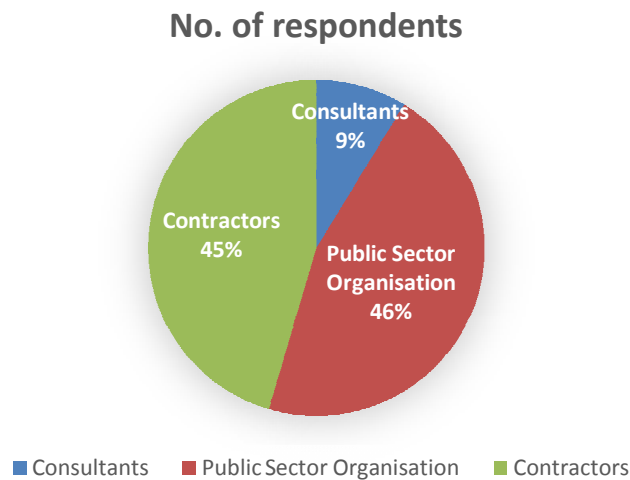
Figure 1 percentage share of responses

5. MAJOR DIFFICULTIES ENCOUNTERED DURING THE CONSTRUCTION PROCESS

As part of study assessment has been made to account for the major constraints encountered during the project. Material shortage, equipment shortage, cash shortage, man power shortage, employer interference, design/drawing related and supervision related problems were short listed by the researcher. Other prominent factors such as unexpected weather condition and security related problems were also discovered through the survey. Table 2 below summarizes the major difficulties encountered.

Material shortage (15 projects) and equipment shortage (11 projects) are the major problems encountered. Manpower shortage (7 projects) and cash shortage (6 projects) are the second most serious problems while design/drawing interference (2 projects) and supervision related (1 project) were non-significant problems while client interference has no affect.

Table 2 Summary of major difficulties encountered

Constraint types	Response rates		
	Yes	No	Unknown
Material shortage	15	10	3
Equipment shortage	11	9	7
Cash shortage	6	6	10
Manpower shortage	7	20	5
Client interference	0	14	8
Design/drawing related	2	15	8
Supervision related	1	17	4
Other's	6	1	15

6. EVALUATION OF CONTRACTORS PERFORMANCE

The surveyed owners, consultants, managers, engineers, and contractors ranked the ''inadequate project management assistance factor as the most important factor affecting efficiency of contractor in construction projects in India at this category, with an Overall Index equal to 66.17%. The major factors that affect contractor efficiency to a great extent are listed in table 3.

Table 3 Major factors constraining performance of contractors from different category

Cat.no.	Category	ID	Factor	Overall Index (OI %)
1	Consultant	19	Inadequate project management assistance	66.17
2	Contractor	10	Inadequate contractor experience	70.23
3	Design	28	Misunderstanding of owner's requirements by design engineer	72.03
4	Equipment	37	low efficiency of equipment	66.07
5	External	43	Delay in obtaining permits from municipality	72.30
6	Labour	59	Shortage of labourer	72.30
7	Material	67	Damage of sorted materials	66.83
8	Owner	78	Delay in progress payments (Funding problems)	67.03
9	Project	94	Complexity of project (project type, project scale, etc.)	67.51

It might be noted that all these factors are originated either by the consultant related factors category, contractor related factors category, design related factors category, equipment related factors category, external related factors category, labour related factors category, material related factors category, owner related factors category, or project related factors category. This is expected since each party is trying to blame the other for causing delays. Researcher desires to compare the strength or the importance of each category; the weighted average value of the causes composing this category was calculated. The results are tabulated in Table 4 by using priority rule formula as shown in the following equation:

$$\text{ERIIj} \ (\%) = \left(\frac{\sum_{n=1}^{n=N}(Pn \ X \ RIIn)}{\sum_{n=1}^{n=N}(Pn)} \right) \qquad (1)$$

where ERIIj (%) is the Equivalent weighted average percentage of Relative Importance Index per category; ORIIn (%) is the Overall weighted average percentage of Relative Importance Index per factor of specific category, which is calculated based upon total years of experiences of all respondents; n is the number represents the factor number in the related category (from first factor of

category n= 1 to from last factor of category n = N); and P_n is the priority weight of the studied factor.It is clear that the results of the nine categories were almost consistent, where the categories are ranked from top to bottom as shown in Table 4.

Table 4 Equivalent average Relative Importance Index of Category

Rank	Category Item	Equivalent average Relative Importance Index Eq. (1)
01	Contractor Related Factors category	64.62
02	Project Related Factors category	63.82
03	Labourer Related Factors category	62.46
04	Design Related Factors category	62.28
05	Owner Related Factors category	60.28
06	Consultant Related Factors category	60.26
07	External Related Factors category	60.25
08	Equipment Related Factors category	59.61
09	Material Related Factors category	59.31

According to Tables, showing the rank and impact of the grouped factors and the ranking of the groups as shown in Table 4.8, three most contributing factors for each group to delay were mentioned as follows: Contractor (EARII =64.62%): The contractor related group of factors affecting performance of contractors was the most important group causing delays. Second important group was the project related group, having the most significant factors as ''Complexity of project (project type, project scale, etc.) (OI = 67.51%),'' third Laborer (EARII =62.46%): After the Laborer, the design related group of factors affecting performance of contractorstook place as the Fourth most important group. The significant factors were ''Misunderstanding of owner's requirements by design engineer" (RII = 72.03%),Owner (EARII =60.28%): Following the owner, the Consultant related group of factors affecting performance of contractors' ranks as the Sixth most important group.

7. CONCLUSION

Lowest bid awards a most common practice for awarding work charge in India whether its public or private sector. The study tried to investigate the various factors affecting efficiency of contractors in case of lowest bid award projects. The noticeable factors were inadequate project management assistance) (OI = 66.17%), external (EARII =60.25%): eighth important group was the Equipment related group. The prominent factors were ''low efficiency of equipment (OI = 66.07%),'' (9) Material (EARII =59.31%). On basis of findings it could be concluded that though lowest bid award is not a primarily a good practice due to firstly the contractor's profit margins are low which contractor is not able to sublet much and tends to employ low efficiency equipment and poor quality materials. Secondly projects management practices should be popularized amongst contractor working in small scale projects this can help them in understanding client's need and hence increasing efficiency, which could in turn benefit the contractor.

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